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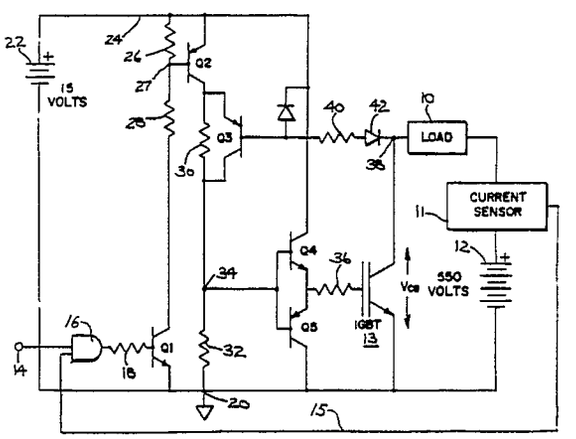
## (54) Power transistor drive circuit with improved short circuit protection.

(57) In response to an input signal (at 14), a gate drive circuit for an insulated gate bipolar transistor (13) initially drives the gate to a first voltage potential which causes the transistor to partially turn on. When the transistor saturates ($V_{38}$ approximates $V_{ce}$) its gate drive voltage is increased ($Q_3$ shorts 30) to increase the conductivity of the transistor and reduce its saturation voltage drop. If, however, a load (10) coupled to the transistor is short circuited ($V_{38}$ approximates $V_{12}$) the transistor will never reach saturation and will remain partially turned on at a point where it has increased short circuit current handling capability. In addition, once the transistor has been fully turned on, should a short circuit load condition occur, the transistor will drop out of saturation causing the drive circuit to reduce the gate voltage ($Q_3$ off) to increase the short circuit current handling capability of the transistor. The transistor can thereby withstand the short circuit current for a longer time until a current sensor (11) acts (through 16) to turn off the transistor.

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# EUROPEAN SEARCH REPORT

Application Number

EP 90 30 3925

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
|---|---|---|---|
| X,Y,A | PATENT ABSTRACTS OF JAPAN vol. 12, no. 449 (E-686)(3296) November 25, 1988 & JP-A-63 177 612 (TOSHIBA CORP. ) July 21, 1988 * the whole document * | 1,2,5,3,4, 6,7 | H 03 K 17/08 |
| Y | US-A-4 095 127 (NEREM) * column 3, line 15 - column 4, line 2; figure 3 * | 3,4 | |
| A | ELEKTROTECHNISCHE ZEITSCHRIFT - ETZ. vol. 108, no. 19, October 1987, BERLIN DE pages 914 - 920; KEUTER ET AL.: 'Optimierte Ansteuerung heutiger Darlington-Leistungstransistoren ' * page 918, left column, line 43 - right column, line 11; figure 5B * | 6 | |

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

H 03 K

The present search report has been drawn up for all claims

| Place of search | Date of completion of search | Examiner |
|---|---|---|
| The Hague | 15 October 91 | CANTARELLI R.J.H. |

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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